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ABSTRACT

Four major education and training markets for multimedia products are: (1) industrial training; (2) management and professional education; (3) medicine and the health sciences; and (4) formal education, including public, higher and adult education. The industrial training market refers to the development of nonmanagerial, technical, and non-technical skills in industry, and focuses on specific applications. Interactive optical technologies have not yet been widely used for training purposes by U.S. businesses because of the incompatibility between hardware systems and the lack of courseware. Courseware development, however, has grown in the managerial and professional marketplace where problem solving and other thinking skills must be taught. International Business Machines' (IBM) InfoWindow has become the standard for videodisc training. The health sciences provide a further market for videodisc programs, and for IBM programs in particular. IBM provides support to the Healthcare Interactive Videodisc Consortium, a group of medical and nursing schools that are developing interactive videodisc instruction for healthcare training. Macintosh computers and Hypercard programs are also becoming popular in the medical education field. Although Hypercard use has grown in the field of formal education over the last decade, education's traditional reluctance to accept new materials or methodologies has hampered the growth of the public education and higher education marketplaces for optical media. Patterns for the development of courseware include vendor-developed and in-house development in all four marketplaces. (5 references) (DB)

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INTERACTIVE OPTICAL TECHNOLOGIES IN EDUCATION AND TRAINING MARKETS

by

Sandra Helsel

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INTERACTIVE OPTICAL TECHNOLOGIES IN EDUCATION AND TRAINING MARKETS

by Sandra Helsel, Ph.D.

Education and training markets for multimedia products are broad and varied. Identifiable characteristics divide these markets in many ways: organizational structures, learner needs, budgets, acceptance of change, development patterns, hardware configurations, etc. It is the purpose of this article to briefly discuss the characteristics of four major education and training markets: 1) industrial training; 2) management and professional education; 3) medicine and the health sciences; and 4) formal education (public, higher, and adult). Information presented herein includes market data, courseware development patterns, and hardware preferences.

Industrial Training Marketplace

"Industrial training" typically refers to the development of nonmanagerial, technical, and non-technical skills in industry. This type of training typically applies to a specific job, usually focuses on specific applications, and is frequently sequential.

Training represents a significant market for interactive optical technologies from several standpoints. In terms of sales dollars, producers of optical media's hardware and software products can move to be included in the nation's training budgets--that in 1988 expended $1.87 billion for hardware, $1.71 billion for custom materials and $1.23 billion for off-the-shelf materials. In terms of educating workers for America's business needs, optical media can be an important

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resource in the nation's drive to develop productive workers and citizens.

Yet, the latest available figures indicate that the majority of American businesses are not using interactive optical technologies for training purposes. A 1988 Training magazine survey reported that only 14.7% of American organizations with over 50 or more employees used interactive videodisc to deliver job-related training.

Incompatibility between hardware systems was one of the major problems confronting industrial training's use of optical media until very recently. However, at the close of the 1980's, the compatibility situation began to improve. In a 1989 Training magazine interview, videodisc expert Rockley Miller stated that IBM's InfoWindow was becoming the defacto equipment standard for industrial training (Gerber, 1989). To add to InfoWindow's dominance, in 1989 Sony introduced a SonyView system which will run courseware developed for InfoWindow.

Three major patterns of courseware development exist in the industrial training marketplace. Many firms develop generic courseware for large markets with similar needs. For example, Applied Learning has a number of videodisc-based programs for PC end user training (operating systems, spreadsheets, word processing) Other optical media firms develop specific programs via a contractual arrangement between themselves and the industrial client. Allen Communications developed a videodisc course to teach Ford electricians how to troubleshoot an Allen-Bradley 8200 Computerized Numerical Controller. Thirdly, large

corporations such as IBM sometimes conduct their own in-house development.

Management/Professional Education

The managerial and professional marketplace requires curriculum (whatever the medium) that teaches students to interpret new situations, to solve problems, to think and reason, and to learn. Optical courseware is particularly suited for simulations that replicate the complex processes of managerial and professional decision making.

In terms of numbers of potential students for this market, there are more than five million beginning and middle-level managers in the United States. The "professional" category includes 1.5 million engineers; 300,000 computer systems analysts; and 800,000 natural, mathematical, and computer scientists.

In terms of numbers of products for this market, 65 videodisc programs were listed under the "Management and Professional" category in the 1989 edition of IBM's "InfoWindow Courseware Guide." This number was a 82% increase over the number of programs listed for the same category in the 1988 catalog. However, according to IBM's Peter Blakeney, that is a relatively small number of videodisc programs when compared to the total managerial/professional audience size.

Managers and professionals typically operate in a business environment--which has traditionally been an MS-DOS environment. That background is reflected in the IBM-compatible configurations used by these groups for educational programs as well as for

business-related software. As with the industrial training market, InfoWindow has become the defacto standard for videodisc training. Sony's new VIW-5000 system and Visage's upgrade systems likewise add to the strength of the InfoWindow standard.

By the end of the 1980's, two development patterns had emerged for the managerial/professional optical courseware marketplace: 1) vendor-sponsored development and 2) in-house. In the vendor-sponsored arena, both traditional publishers and interactive media publishers have developed videodisc programs for managerial or professional audiences. Allyn and Bacon was one of the first traditional textbook publishers to fund the development of a videodisc--their "Experiencing Management" videodisc was designed to be used in conjunction with their post-secondary management textbooks. In-house development is often sponsored by large corporations, but very often those programs are not made commercially available.

Medical/Health Sciences Marketplace

By the beginning of the 1990's decade, the medical education community had become the most active and best-organized of all the markets that are producing, using, and researching interactive optical technologies. This market's efforts reflected the recommendations made in the mid-80's by the American Medical Colleges Project Panel on General Professional Education: promote health and prevent disease; integrate basic science teaching and clinical education; develop skills, values, and attitudes to the same extent as the acquisition of knowledge; train students to be active, independent problem-solvers rather

than passive recipients of information (Muller, 1984).

The health sciences are currently the second largest market for videodisc programs. The 1989 guide to Videodiscs in Healthcare lists over 400 videodiscs, but approximately only one-fourth of these titles are commercially available. AS for CD-ROM, medical education ranked sixth in numbers of CD-ROM related titles in Bower's 1988 Optical Publishing Directory.

The numbers of consortia related to interactive technologies is a striking feature of the health sciences market. The Interactive Healthcare Consortium is dedicated to the development and distribution of interactive videodisc courseware in the health sciences. IBM provides support to the Healthcare Interactive Videodisc Consortium, a group of 18 medical and nursing schools in the United States and Canada that are developing interactive videodisc instruction for healthcare training. Dentistry also has a consortium, the Consortium on MultiMedia and Interactive Technology to Enrich Dentistry.

The medical field even has its own bimonthly journal devoted to multimedia technologies--The Interactive Healthcare Newsletter published by Stewart Publishing in Alexandria, Virginia.

According to Thomas Singarella (1989) at the University of Tennessee, "InfoWindow claims the major share of the videodisc hardware market in the health sciences." Medical educators across the country attribute InfoWindow's dominance to IBM's participation in the Healthcare Interactive Videodisc Consortium. Stewart (1989) agreed that InfoWindow will continue to be the

standard for commercially produced videodisc programs, but he also stated that the medical education field will also see a growth in the numbers of Macintosh computers since more and more professors are beginning to create Hypercard stacks for use with generic programs.

Optical courseware programs for the medical and health sciences have been produced by more than 25 different sources including medical manufacturers, medical schools, insurance companies, military medical groups, independent videodisc producers, and pharmaceutical companies. However, four major development patterns dominate the development: 1) consortium-funded development; 2) university-sponsored; 3) vendor development; and 4) pharmaceutical development.

Public/Higher/Adult Education

Education's traditional reluctance to accept new materials or methodologies has hampered the growth of the public education and higher education optical media marketplaces.

Kurz, president of Ztek--one of the leading firms marketing optical media products to all levels of education--explained that growth in the educational marketplace has never been steady or exponential. Rather, this market has been historically characterized by surges of growth that are followed by plateaus. The introduction of Hypercard was one of the strongest stimulants to growth in this marketplace over the last decade. IBM's more recent introduction of LinkWay, and the HyperStudio for Apple IIGS are likewise expected to spur growth in education.

It is difficult to directly measure the K-12 optical media

market because many schools and teachers purchase inexpensive consumer equipment at local commercial outlets. The higher education marketplace is fragmented since it encompasses community colleges, four-year public and private colleges, universities, and university based research laboratories. However, in an article that discussed NeXt's positioning, Nelson (1989) estimated that higher education's market niche for optical technologies could be worth $112 billion.

The majority of interactive optical courseware for education are developed by these processes: 1) by vendors such as Optical Data or Systems Impact who specialize in these markets; 2) by colleges/universities who quite often develop programs via outside funding; 3) by educators repurposing existing generic programs.

Conclusion

The breadth and variety of the major educational and training markets make it difficult to provide a comprehensive description of all important characteristics of each market in one article. However, a brief overview was provided herein. Readers desiring in-depth information concerning any of these markets are referred to the book from which this article was drawn: Interactive Optical Technology in Education and Training: Markets and Trends.

Biography

Sandra Helsel, Ph.D. consults and writes extensively about bridging the gap between theory and practice for educational

multimedia. She is co-editor of the new journal Multimedia Review and correspondent for The Videodisc Monitor. Her book Interactive Optical Technology in Education and Training: Markets and Trends is available from Meckler Publishing. She completed her doctoral research at the University of Arizona and her dissertation was one of the first to be devoted to educational videodisc. Box 2122; Goleta, CA 93118; 805/685-0487.

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